

Claims

1. Rolled, forged or extruded aluminum alloy product more than 12 mm thick, heat treated by solutionizing, quenching and artificial aging, having a fraction of recrystallized grains measured between one-quarter thickness and mid-thickness of the final wrought product smaller than 35% by volume, and a characteristic intercept distance between recrystallized areas greater than 250 μm .

2. The product according to claim 1, wherein the characteristic intercept distance between recrystallized areas is greater than 300 μm

3. The product according to claim 2, wherein the characteristic intercept distance between recrystallized areas is greater than 350 μm

4. The product according to claim 1 made of an AlZnMgCu alloy with the following composition (weight %):

Zn : 4-10 Mg : 1-4 Cu : 1-3.5 Cr < 0.3 Zr < 0.3 Si < 0.5 Fe < 0.5,
other elements > 0.05 each and < 0.15 total, the remainder being aluminum.

5. The product according to claim 4, wherein the alloy is selected from 7010, 7020, 7040, 7049, 7050, 7055, 7060, 7075, 7149, 7150, 7175, 7349, 7449, 7475.

6. The product according to claim 1, having a Ti content between 0.01 and 0.03 weight % and a B content between 1 and 10 $\mu\text{g/g}$.

7. The product according to claim 6, having a Ti content between 0.01 and 0.02 weight %.

8. Method for manufacturing a heat-treatable aluminum alloy product comprising:

- casting the alloy in the form of a rolling, forging or extrusion ingot, such that the grain size is kept between 250 μm and 800 μm ,
- homogenization,
- hot transformation at a controlled temperature to obtain a fraction of recrystallized grains measured between the quarter and half thickness of less than 35% by volume,
- solution heat treating,
- quenching,
- possibly stress relaxation by controlled deformation (tension or compression),
- artificial aging.

9. The method according to claim 8, wherein the alloy is an AlZnMgCu alloy with the following composition (weight %):

Zn : 4-10 Mg : 1-4 Cu : 1-3.5 Cr < 0.3 Zr < 0.3 Si < 0.5 Fe < 0.5,
other elements > 0.05 each and < 0.15 total, the remainder being aluminum,

10. The method according to claim 8, wherein the Ti content is between 0.01 and 0.03 weight % and B between 1 and 10 $\mu\text{g/g}$.

11. The method according to claim 10, wherein the Ti content is between 0.01 and 0.02 weight %.

12. Ingot for rolling, forging or extrusion, made of a heat-treatable aluminum alloy having an as-cast grain size kept between 250 μm and 800 μm , which is suitable for the manufacture of wrought products for aircraft structural members.

Zn : 4-10 Mg : 1-4 Cu : 1-3.5 ~~Cr < 0.3~~ Zr < 0.3 Si < 0.5 Fe < 0.5
Ti : 0.01-0.03 B : 1-10 ppm, other elements > 0.05 each and 0.15 total, the
remainder being aluminum,

15. Structural member for airframe structures, made in a rolled, forged or extruded product according to claim 1.